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THE CHANGES IN PSYCHOLINGUISTIC FUNCTIONING OF CHILDREN AFTER ONE YEAR IN AN "INTEGRATED" SCHOOL.

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A STUDY WAS CONDUCTED TO ASSESS THE CHANGES IN THE PSYCHOLINGUISTIC FUNCTIONING OF NEGRO AND WHITE KINDERGARTEN AND FIRST-GRADE PUPILS ONE YEAR AFTER THE INTEGRATION OF SIX SUBURBAN SCHOOLS. THE ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITY WAS ADMINISTERED BEFORE AND AFTER SCHOOL REASSIGNMENT TO PUPILS IN (1) THE PREDOMINANTLY NEGRO URBAN SENDING SCHOOL, (2) THE PARTIALLY NEGRO (50 PERCENT) NON-SENDING COMPARISON SCHOOL IN THE SAME AREA, AND (3) THE SUBURBAN RECEIVING SCHOOLS. IT WAS FOUND THAT THE REASSIGNMENT PROGRAM HAD NO NOTICEABLE EFFECT ON THE SENDING SCHOOL PUPILS, WHO CONTINUED AS BEFORE TO SCORE LOWER THAN THEIR SUBURBAN COUNTERPARTS. HOWEVER, THE PROGRAM SEEMED TO HAVE NO NEGATIVE EFFECT ON THE LANGUAGE PERFORMANCE OF CHILDREN FROM EITHER THE SENDING OR RECEIVING SCHOOLS. CHILDREN ORIGINALLY IN THE RECEIVING SCHOOLS MAINTAINED AND EVEN IMPROVED THEIR PERFORMANCE LEVEL ON THE LANGUAGE SCALES. SPECIFICALLY, THE AVERAGE GAIN IN RAW SCORE POINTS ACROSS ALL THE TEST SUBSCALES WAS PLUS 2.9 FOR THE CHILDREN FROM THE SENDING SCHOOL GROUP, PLUS 2.8 FOR THE COMPARISON SCHOOL GROUP, AND PLUS 3.7 FOR THE RECEIVING SCHOOLS GROUP. THE GREATEST GAIN FOR THE SENDING SCHOOL GROUP WAS 4.4 POINTS ON THE AUDITORY DECODING SUBSCALE. THE COMPARISON AND THE RECEIVING SCHOOLS GROUPS BOTH GAINED MOST ON THE MOTOR ENCODING SUBTEST, 4.1 AND 8.3 RAW SCORE POINTS RESPECTIVELY. TABLES ARE APPENDED. (LB)

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The Changes in Psycholinguistic Functioning of Children After One Year in an "Integrated" School[1, 2]

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Children in the kindergarten and first grade from 3 school settings were tested with the Illinois Test of Psycholinguistic Ability (ITPA) in the spring of 1965. One group of children attended a de facto segregated school (approximately 70% Negro). This school was closed during the 1965-66 school year, and pupils were bussed to schools in the suburbs. Group 2 was made up of children from the same geographic area as the first group but these children attended a different school (approximately 50% Negro) which continued to operate during the 1965-66 school year. Group 3 children, predominantly Caucasian, attended schools scheduled to receive Group 1 children.

All of these children were post-tested with the ITPA in the spring of 1966, with these results: (a) The average gain in raw score points across all ITPA subscales was +2.9 for Group 1, +2.8 for Group 2, and +3.7 for Group 3; (b) The greatest gain for the reassigned group was 4.4 points on the auditory decoding subscale; (c) The remainer group and the receiver school group both gained the most on the Motor Encoding subtest, 4.1 and 8.3 raw score points respectively.

In the spring of 1965 the school board in a suburban midwestern community of 90,000 people declared one of its elementary schools, where 70 per cent of the pupils were Negro, de facto segregated. The board decided to close the school, which was located in the central part of the city where a disproportionate number of the community's seven per cent Negro population lived, and reassign the children to several schools in the outlying suburban areas of the city. These latter schools had few, if any, Negro pupils.

The school board decided to ask for a study of the effects of its reassignment program on children in the de facto segregated school as well as those children in schools scheduled to receive the reassigned children (receiver schools).

There are certainly many different factors which ought to be examined to determine the effects of a reassignment program. The present study reports effects only in the area of psycholinguistic development as measured by a single instrument. The reader should be aware that these are, therefore, only partial results and that, though of importance, they do not tell the whole story.

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Method

Measure. The Illinois Test of Psycholinguistic Ability developed by Kirk and McCarthy at the Institute for Exceptional Children, University of Illinois,

was used to measure change. A critical evaluation of this test is available (Weener, Barritt, Semmel, 1967).

Insert Table 1 about here

The test yields nine subscale scores and a total score. A listing of subtests along with a sample item from each can be seen in Table 1.

Sample. In the spring of 1965 when the study began it was decided that observable changes in language functioning were most likely to occur in younger children. For this reason it was decided to use for comparison kindergarten and first grade groups from three school populations. A description of the race and sex of the children in each of the three school samples can be seen in Table 2.

Insert Table 2 about here

The children in Group 1 attended the de facto segregated school and were scheduled to be reassigned. These were all of the children attending the kindergarten and first grade in that school in 1965 (the reassigned group).

Group 2 represents a comparison sample for Group 1. Group 2 children lived in the same area of the city as the children who were to be reassigned. However, the children in Group 2 were at another school at which the racial makeup was about 50 per cent Negro and 50 per cent Caucasian. Since these children were from the same area and were remaining in their present school, they made a fair, if somewhat imprecise, control or comparison for our treatment group. The children in Group 2 were randomly selected from among all the children attending the kindergarten and first grade in that school who also lived in the rather well-defined geographic area which could be called a "ghetto." In other words, Group 2 (remainer group) contained only children from the same dwelling area as our treatment group.

Group 3 (receiver group) included children randomly selected from the kindergartens and first grades at six schools scheduled to receive reassigned pupils.

The reduced number of children available for post-testing in 1966 results from pupils moving out of the school district. It should be noted that losses from groups remain relatively stable across the three samples.

Testing. All children were pre- and post-tested during the latter part of April in 1965 and 1966, respectively. Testing was done individually by examiners

trained in ITPA administration by the experimenters with the aid of Illinois-trained ITPA examiners.[3] Testing was done in small rooms made available by the public school or else in a research trailer parked on the school playground.[4]

Results

The results from the initial testing in April 1965 are presented in Tables 3 and 4. Table 3 reports the scores for kindergarten children and Table 4 the first grade scores. These are mean standard scores based upon the norming group used in the development of the ITPA. The norm group included only Caucasian children from Decatur, Illinois, whose IQ scores fell between 80 and 120 (Kirk & McCarthy, 1963).

Looking first at the kindergarten samples we find that the children in the receiver group (Group 3) are at or above the mean on all but one subscale. The

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Insert Tables 3 and 4 about here

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children in our sample from the inner city area in Groups 1 and 2 fall below the mean of the norming group on every subscale, except in the case of Group 2, which has a positive score on the sequential (digit repetition) test.

For the first-grade groups the differences between the three samples are diminished. The receiver group children in our first-grade sample are below the standardization mean on three subscales. The children from the inner city area are below the standardization sample mean on six and four subscales respectively for Groups 1 and 2.

After one year in a new school setting the ITPA was again administered to the children remaining in our samples in April 1966. Tables 5 and 6 report post-test scores for the first and second grades separately.

Insert Tables 5 and 6 about here

The first grade receiver school children attained higher scores than their Group 1 and 2 counterparts. As in 1965, Group 3 was below the mean on only one subscale while Group 1 fell below the standard score mean on every subtest. The children in Group 2 who lived in the same area and attended a neighborhood school were below the mean on five of the nine subscales. The pattern of the scores had changed very little during the 1965-66 school year. The second grade children

in Group 3 were above the mean on all but one subtest. Second grade children in Groups 1 and 2 were above the standardization sample means on all but three subtests.

Analysis of changes over the one-year period involved in the study was made using raw scores. Standard score changes do not permit comparison of sub-scale growth. Tables 7 and 8 compare gain scores for the two age groups in

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Insert Tables 7 and 8 about here

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the three samples. Table 7 summarizes the growth from kindergarten to first grade; Table 8 summarizes the changes in test performance from first to second grade. .

It can be seen in Table 7 that in all but two cases growth seems to be at about the same rate for each of the first grade groups. In one case the reassigned children gained more than their non-reassigned counterparts and in one case the reverse condition was observed.

For the older children there is more consistency than inconsistency between groups in amount of growth over the year interval. The pattern of change favors Group 3 children, particularly when the change in total score is examined. Group 3 children gained ten more total score points than the children in either Groups 1 or 2.

Discussion

It is difficult to identify cause and effect relationships under any conditions in scientific research. The causal chain leading to the effects studied in this paper are even more difficult to isolate. It should be recognized that no precise control was exercised over the experiences afforded the three groups in this study.

Each child in each group was exposed to a number of common experiences and many unspecified different experiences. The present study looks at changes in a specific subset of language tasks and attempts to identify trends which exist in common within a group and differences between groups. Effects of the program on other factors were not examined and therefore no conclusion about the overall impact of the reassignment can be drawn from these data.

With these qualifications clearly in mind the following statements are warranted by our data:

1. Children living in the "ghetto" area of the city have generally lower scores on ITPA subscales than their counterparts living in the suburban areas of the community. Reassignment of Group 1 children from their local school to a number of suburban schools produced no noticeable change in this pattern.

2. There is no evidence that reassigning Group 1 children from their neighborhood school to outlying suburban schools has a harmful or negative effect upon their language performances as measured by ITPA subscales, nor does such a program reduce the performance of the children attending receiver schools. In Figures 1 and 2 it can be seen that changes in raw scores were relatively constant for Groups 1 and 2. Group 1 was reassigned and Group 2 was not. At the very least one can assert that no negative effect was produced as a function of the reassignment program.

Insert Figures 1 and 2 about here

Group 3 children who had attended and continued to attend suburban schools maintained and even improved their performance level on the language scales used here. In fact, for both the older and younger groups of receiver school children, there was a standard score increase over the one-year period when these children attended an "integrated" school. There is no evidence here that cognitive performance as measured by these language scales was impaired during this year of school for either reassigned or non-reassigned children.

3. A consistent pattern of change in subscale scores for the two age groups was not observed. Larger growth scores for one group at the first grade level are seldom reproduced for the same group at the second grade level. The pattern of subscale gain scores for the first grade group is different than for the second grade group.

In conclusion we would like to point out that these data represent observed changes after one year. Future testing of these children after 2-, 3-, 4-, or 5-year periods might well alter the patterns observed in this study.

References

McCarthy, J. J., & Kirk, S. A. *The construction, standardization and statistical characteristics of the Illinois Test of Psycholinguistic Abilities.* Madison, Wis.: Photo Press, 1964.

Weener, P. D., Barritt, L. S., & Semmel, M. I. A critical evaluation of the Illinois Test of Psycholinguistic Abilities. *Exceptional Children,* 1967, *33,* 373-380.

Footnotes

[1]The research reported herein was performed pursuant to Contract OEC-3-6-061784-0508 with the U. S. Department of Health, Education and Welfare, Office of Education, under the provisions of P.L. 83-531, Cooperative Research, and the provisions of Title VI, P.L. 85-864, as amended. This research report is one of several which have been submitted to the Office of Education as *Studies in language and language behavior, Progress Report V,* September 1, 1967.

[2]This report is based on a paper presented at the AERA Meeting, New York City, February 17, 1967.

[3]The authors wish to thank Dr. and Mrs. David Ryckman for their help in training ITPA examiners.

[4]The authors wish to thank the Language Development group of the Center for Research on Human Growth & Development for permission to use their research trailer.

Figure Captions

Fig. 1. Raw score changes in ITPA subscales, 1965 to 1966, for first grade children, 1966.

Fig. 2. Raw score changes in ITPA subscales, 1965 to 1966, for second grade children, 1966.

Table 1

DESCRIPTION OF ITPA SUBTESTS

1. Auditory Vocal Automatic--Correct grammatical form must be provided in sentences, e.g., Here is an apple. There are two _____.
2. Visual Decoding--Matching a stimulus picture to its perceptual counterpart, e.g., Office table and coffee table.
3. Motor Encoding--Expressing one's ideas in terms of meaningful gesture, e.g., "Show me what you should do with this." (hammer)
4. Auditory Vocal Association--A verbal analogies test, e.g., Soup is hot. Ice cream is ____.
5. Visual-Motor Sequencing--Sequence of geometric shapes must be reproduced from memory.
6. Vocal Encoding--Describe a simple object verbally, e.g., block, nail.
7. Auditory Vocal Sequencing--Digit repetition as in Binet.
8. Visual Motor Association--Relate pictures on some conceptual basis, e.g., sock with shoe.
9. Auditory Decoding--Vocabulary test requiring only "yes" or "no" answer, e.g., Do females slumber?

Table 2

A DESCRIPTION AND COMPARISON OF THE SPRING 1965 AND SPRING 1966 SAMPLES

	1965 (Pretest groups)								1966 (Posttest groups)							
	Kindergarten				First Grade				First Grade				Second Grade			
	Male		Female		Male		Female		Male		Female		Male		Female	
	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
Group 1 (reassigned)	3	13	3	13	4	14	1	13	3	7	1	10	3	7	0	9
	16		16		18		14		10		11		10		9	
Total	32				32				21				19			
Group 2 (remainer)	2	7	5	17	8	9	8	9	1	3	5	11	6	6	5	7
	9		22		17		17		4		16		12		12	
Total	31				34				20				24			
Group 3 (receiver)	14	0	16	0	16	2	12	2	10	0	7	0	12	1	10	1
	14		16		18		14		10		7		13		11	
Total	30				32				17				24			

Table 3

STANDARD SCORE FOR KINDERGARTEN SAMPLES 1965

ITPA Subscales	MEAN Grp. 1	MEAN Grp. 2	MEAN Grp.3	F Overall Diff.	Signf. Grp. Diff.	STANDARD DEVIATION Grp. 1	STANDARD DEVIATION Grp. 2	STANDARD DEVIATION Grp. 3
Aud. Voc. Auto.	-.78	-.18	.09	5.09**	1.3*	1.14	1.21	.97
Vis. Dec.	-.16	-.28	.29	3.09		.90	1.03	.91
Mot. Enc.	-.80	-.56	-.02	7.30**	1.3** 2.3*	.84	.82	.80
Aud. Voc. Assoc.	-.63	-.45	.43	8.61**	1.3** 2.3**	1.28	.97	.91
Vis. Mot. Seq.	-.08	-.40	.11	2.10		1.26	.81	.86
Voc. Enc.	-.45	-.76	.08	5.00**	2.3*	.79	.95	1.17
Aud. Voc. Seq.	-.05	.25	.14	.67		1.20	1.04	.86
Vis. Mot. Assoc.	-.36	-.30	.37	4.17	1.3* 2.3*	1.05	1.25	.98
Aud. Dec.	-.66	-.10	.29	6.82**	1.3**	.91	1.05	1.08
TOTAL	-.74	-.51	.34	7.94	1.3** 2.3**	1.20	.99	1.15

* $p < .05$
** $p < .01$

Table 4

STANDARD SCORE FOR FIRST GRADE SAMPLES 1965

ITPA Subscales	MEAN Grp. 1	Grp. 2	Grp. 3	F Overall Diff.	Signf. Grp. Diff.	STANDARD DEVIATION Grp. 1	Grp. 2	Grp. 3
Aud. Voc. Auto.	-.42	.05	.24	3.79*	1.3*	1.17	.82	.98
Vis. Dec.	-.36	.02	.09	1.87		.98	.81	1.19
Mot. Enc.	-.62	-.20	-.46	1.62		.89	.85	1.09
Aud. Voc. Assoc.	-.22	.24	.46	2.58		1.14	1.12	1.38
Vis. Mot. Seq.	-.49	-.41	-.44	.07		.86	.96	.79
Voc. Enc.	.16	-.03	-.36	2.14		1.24	1.00	.82
Aud. Voc. Seq.	.13	.23	.52	1.13		1.01	1.18	1.02
Vis. Mot. Assoc.	.10	-.28	.05	1.49		.88	.88	1.12
Aud. Dec.	-.22	.28	.76	4.74*	1.3**	1.31	1.28	1.24
TOTAL	-.31	-.13	.09	.78		1.30	1.21	1.31

* $p < .05$
** $p < .01$

Table 5

STANDARD SCORE FOR FIRST GRADE SAMPLES 1966

ITPA Subscales	MEAN Grp. 1	Grp. 2	Grp. 3	F Overall Diff.	Signf. Grp. Diff.	STANDARD DEVIATION Grp. 1	Grp. 2	Grp. 3
Aud. Voc. Auto.	-.11	.15	.39	1.36		1.02	.77	.97
Vis. Dec.	-.44	.12	.50	5.19**	1.3**	1.01	.94	.71
Mot. Enc.	-.72	-.25	.22	3.31*	1.3*	1.31	1.20	.73
Aud. Voc. Assoc.	-.02	.10	.48	1.14		.81	.68	1.54
Vis. Mot. Seq.	-.60	-.31	-.49	.40		1.19	1.02	.88
Voc. Enc.	-.28	-.13	.95	6.94**	1.3** 2.3**	1.26	.94	1.00
Aud. Voc. Seq.	-.21	.43	.30	1.90		1.29	.98	1.00
Vis. Mot. Assoc.	-.25	-.20	.26	2.46		.79	.73	.77
Aud. Dec.	-.15	-.16	.91	6.37**	1.3** 2.3**	.99	1.05	1.08
TOTAL	-.62	-.08	.72	5.87	1.3** 2.3*	1.36	1.02	1.21

* $p < .05$
** $p < .01$

Table 6

STANDARD SCORE FOR SECOND GRADE SAMPLES 1966

ITPA Subscale	MEAN Grp. 1	MEAN Grp. 2	MEAN Grp. 3	F Overall Diff.	F Signf. Grp. Diff.	STANDARD DEVIATION Grp. 1	STANDARD DEVIATION Grp. 2	STANDARD DEVIATION Grp. 3
Aud. Voc. Auto.	.33	.22	.83	3.19*		.93	1.04	.67
Vis. Dec.	.17	.46	.47	.77		.77	.71	1.07
Mot. Enc.	-.05	.58	.95	6.12**	1.3**	1.14	1.01	.65
Aud. Voc. Assoc.	-.27	-.04	.52	3.38*	1.3*	1.19	1.03	.91
Vis. Mot. Seq.	-.21	-.23	-.22	.00		.88	.94	1.02
Voc. Enc.	.46	.11	.57	1.36		1.00	1.11	.89
Aud. Voc. Seq.	.48	.20	.93	2.34		.86	1.44	1.12
Vir. Mot. Assoc.	.32	-.21	.31	2.86		.88	.85	.88
Aud. Dec.	.30	.28	1.02	3.71*	2.3*	1.21	1.16	.77
TOTAL	.27	.17	1.06	4.34**	2.3*	1.22	1.19	.96

* $p < .05$
** $p < .01$

Table 7

MEAN CHANGES IN RAW SCORES FOR KINDERGARTEN - FIRST GRADE SAMPLES

Variable	Group 1 Mean	N	Group 2 Mean	N	Group 3 Mean	N	F Overall Diff.	Sign.† Group Diff.	STANDARD DEVIATION Group 1	Group 2	Group 3
Aud. Voc. Auto. 1	3.67	21	2.20	20	3.12	17	1.00		3.41	3.40	3.14
Vis. Dec. 2	.95	21	3.80	20	2.70	17	4.22*	1,2*	2.92	3.38	3.20
Motor Enc. 3	3.33	21	4.45	20	2.82	17	.78		3.18	4.86	4.14
Aud. Voc. Assoc. 4	3.62	21	3.15	20	2.35	17	1.07		3.03	1.81	3.0
Vis. Mot. Seq. 5	.00	21	2.20	20	-.71	17	1.70		5.65	5.63	3.44
Voc. Enc. 6	4.86	21	5.70	20	9.59	17	2.35		6.96	5.80	8.28
Aud. Voc. Seq. 7	2.19	21	4.15	20	4.77	17	1.34		5.96	5.21	3.73
Vis. Mot. Assoc. 8	4.86	21	3.45	20	3.29	17	.75		3.88	5.64	3.39
Aud. Dec. 9	6.19	21	1.75	20	5.18	17	3.65*	1,2*	3.25	5.88	6.96
TOTAL SCORE 10	29.67	21	30.40	20	33.7	17	.25		17.29	19.77	17.49

* $p<.05$
** $p<.01$

† Using Tukey test for posterior comparisons

Table 8

MEAN CHANGES IN RAW SCORES FOR FIRST GRADE - SECOND GRADE SAMPLES

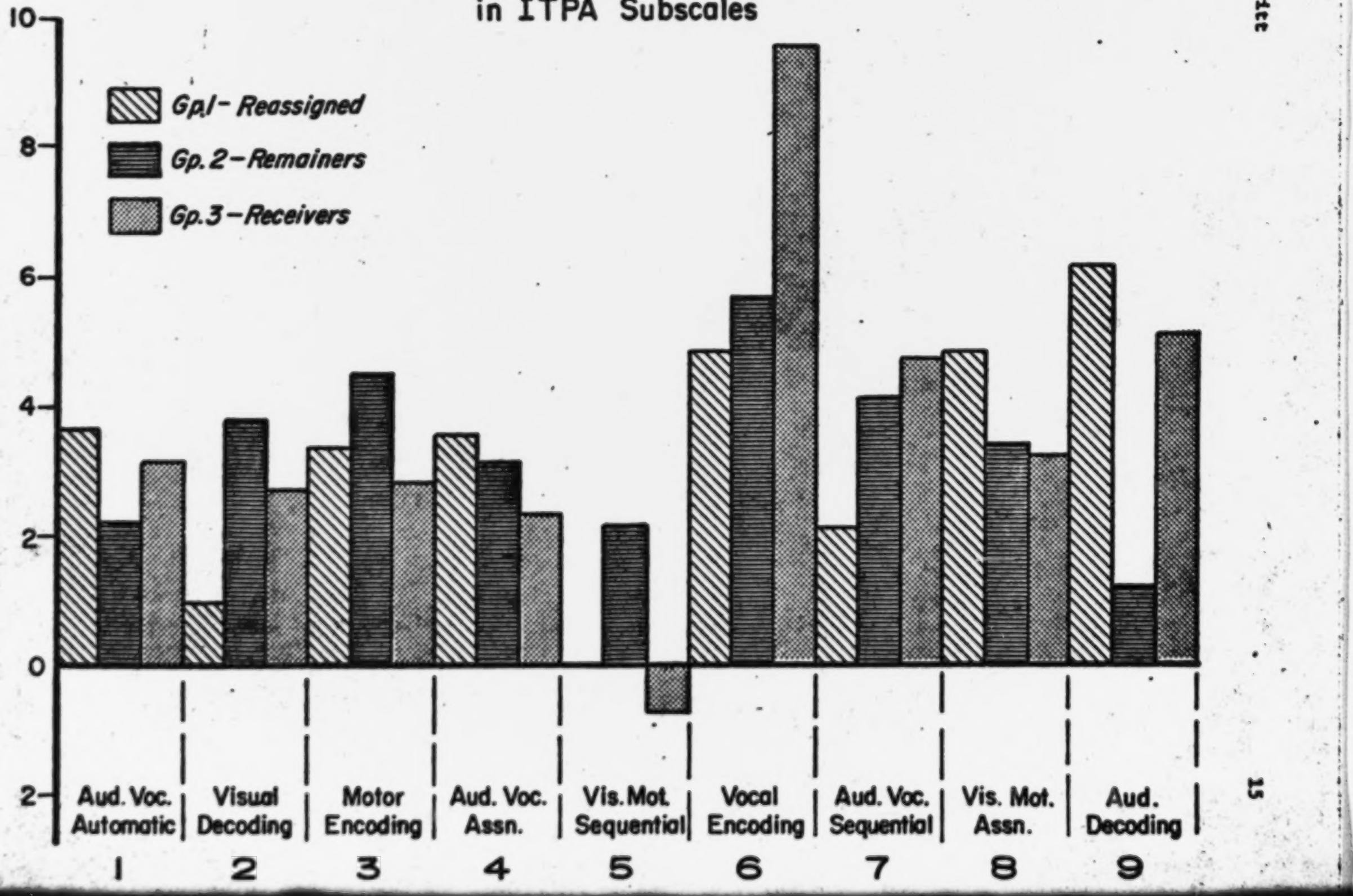
Variable	Group 1 Mean	N	Group 2 Mean	N	Group 3 Mean	N	F Over-all Diff.	Sign. † Group Diff.	STANDARD DEVIATION Group 1	Group 2	Group 3
Aud. Voc. Auto. 1	3.47	19	2.38	24	4.21	24	3.34*	2.3*	2.53	2.86	1.96
Vis. Dec. 2	2.74	19	3.21	24	2.08	24	.89		3.43	2.40	3.02
Motor Enc. 3	2.00	19	3.79	24	5.63	24	5.18**	1.3**	3.33	3.77	3.84
Aud. Voc. Assoc. 4	1.32	19	1.17	24	1.88	24	.84		2.06	1.44	2.35
Vis. Mot. Seq. 5	1.79	19	2.42	24	2.17	24	.15		4.08	3.91	3.41
Voc. Enc. 6	3.21	19	2.50	24	7.33	24	4.11*	1.3*	8.20	5.33	5.21
Aud. Voc. Seq. 7	3.32	19	2.17	24	4.0	24	1.63		3.60	2.68	4.21
Vis. Mot. Assoc. 8	2.00	19	2.96	24	3.13	24	.38		4.30	3.34	5.39
Aud. Dec. 9	2.47	19	.83	24	2.04	24	.55		6.75	4.66	4.93
TOTAL SCORE 10	22.32	19	22.25	24	32.46	24	4.16*	1.3* 2.3*	11.77	14.47	14.69

* $p < .05$
** $p < .01$

† Using Tukey test for posterior comparisons

Fig. 1

First Grade Children 1966
Raw Score Changes 1965 to 1966
in ITPA Subscales



Barrett

Fig. 2

Second Grade Children 1966
Raw Score Changes 1965 to 1966
in ITPA Subscales